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10/804,746	03/19/2004	Sadayori Hoshina	45616/276001	7670

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EXAMINER	
BOWERS, NATHAN ANDREW	
ART UNIT	PAPER NUMBER
1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/804,746	HOSHINA ET AL.	
	Examiner	Art Unit	
	NATHAN A. BOWERS	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1) Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Portier (US 4859594).

Portier discloses a system for biodegrading toxic chemicals that involves using microorganisms to remove organic pollutants such as chlorinated phenols. Column 8, line 21 to column 9, line 2 states that the microorganisms are pretreated in the presence of the specific organic pollutant in order to allow the microorganism to adapt to the toxicant and assimilate it as a preferred source of carbon. Column 10, lines 3-19 further states that cells are harvested following pretreatment via centrifugation. A reaction tank is used to accommodate immobilized cultures of the microorganism, and to facilitate the decomposition of the organic pollutant.

In system and apparatus claims, patentable weight is not given to material worked on. As claim 1 is currently written, patentable weight is only given to the positively recited (1) reaction tank and (2) centrifuge. It is irrelevant what is subsequently placed inside the reaction tank and centrifuge since this merely represents material worked on. Any reaction tank and any centrifuge is inherently capable of accommodating the recited cell/contaminated matter/aqueous medium mixture.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2) Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkata (US 6723242) in view of Portier (US 4859594).

With respect to claim 1, Ohkata discloses a reaction tank that is fully capable of receiving crushed cells, contaminated matter and an aqueous medium. This reaction tank is fully capable of accommodating the recited cell/contaminated matter/aqueous medium mixture. Ohkata, however, does not teach that a centrifuge is used to consolidate and recover the cell fraction prior to introduction into the reaction tank.

Portier discloses a method for biodegrading toxic chemicals that involves using microorganisms to remove organic pollutants such as chlorinated phenols. Column 8, line 21 to column 9, line 2 states that the microorganisms are pretreated in the presence of the specific organic pollutant in order to allow the microorganism to adapt to the toxicant and assimilate it as a preferred source of carbon. Column 10, lines 3-19 further states that cells are harvested following pretreatment via centrifugation.

Ohkata and Portier are analogous art because they are from the same field of endeavor regarding biodegrading toxic chemicals.

At the time of the invention, it would have been obvious to purify and isolate the cell mixture disclosed by Ohkata using centrifugation prior to introduction into the reaction tank. As evidenced by Portier, centrifugation is considered to be a notoriously well known means for recovering whole cells and crushed cells as a pellicle fraction. Centrifugation would have been beneficial because it is a low cost means capable of removing excess fluid and waste from the cell fraction prior to treatment.

With respect to claim 2, Ohkata and Portier disclose the apparatus set forth in claim 1 as set forth in the 35 U.S.C. 103 rejection above. In addition, Ohkata states that following dioxin

degradation, fluids are moved form the reaction tank (Figure 2:22) to a solid-liquid separating tank (Figure 2:23). Processed liquid is removed via transfer line (Figure 2:53), and surplus sludge is removed via a drain (Figure 2:59). Column 27, lines 23-30 state that filtration means are used during solid-liquid separation.

With respect to claims 3 and 4, Ohkata and Portier disclose the apparatus set forth in claims 1 and 2 as set forth in the 35 U.S.C. 103 rejections above. Additionally, Ohkata teaches that a pre-treatment tank (Figure 2:20) is provided for soaking contaminated matter (Figure 2:K) with water (Figure 2:L1). A fluid transport means (Figure 2:51) is also provided for transporting the fluid comprising the contaminated matter toward the reaction tank (Figure 2:22). Ohkata, however, does not expressly disclose the use of a seclusion means for secluding a source of the contaminated matter. Regardless, valves that act as secluding means are considered to be notoriously well known in the art.

3) Claims 1, 7 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weinstein (US 6420165) in view of Numata (US 6521444) and Portier (US 4859594).

With respect to claims 1, 7, 13 and 17, Weinstein discloses an apparatus and method for cleaning a contaminated matter comprising dioxins. The system comprises a reaction tank for holding cells comprising a pellicle of *Bacillus midousuji* cultured in the presence of dioxin contaminants. Weinstein teaches that aqueous solutions of contaminated organic matter are cleansed of dioxin contaminants through the biological action of the *Bacillus midousuji* cells. This is described in column 2, line 66 to column 3, line 25, column 8, lines 23-67 and column 17,

lines 65-67. The *Bacillus midousuji* cells degrade dioxin contaminants by breaking the ether bond of the aromatic dioxin ring. Weinstein, however, does not expressly indicate that the *Bacillus midousuji* cells are crushed.

Numata discloses a method for cleaning a contaminated matter by decomposing organic halogenated compounds. Numata teaches in column 3, line 63 to column 4, line 14 and in column 24, lines 26-44 that it is known in the art to crush microorganisms prior to the treatment of contaminated matter in order to prevent undesired effects on the environment.

Weinstein and Numata are analogous art because they are from the same field of endeavor regarding biological decontamination systems.

At the time of the invention, it would have been obvious to crush the cultured *Bacillus midousuji* cells disclosed by Weinstein prior to their introduction into the contaminated matter. As disclosed by Numata, this type of crushing is beneficial because it reduces the environmental impact associated with the delivery of microbes into a sample volume. Although Numata does state that crushing can be undesirable because it requires expensive equipment and a lot of time and labor, this concern must be considered with the previously stated advantages in mind. If one of ordinary skill in the art, according to an economic calculation, valued the ability to introduce inactive, crushed cells to a sample to remove contaminants over reduced costs and labor, then it would have been obvious to crush the microorganisms of Weinstein prior to decontamination procedures.

Weinstein and Numata still fail to disclose Applicant's claimed invention because Weinstein does not clearly indicate that the *B. midousuji* cells are cultured in the presence of a

chlorinated aromatic compound prior to crushing and exposure to dioxins, or that the *B. midousuji* cells are centrifuged to separate the crushed cells into a pellicle fraction.

Portier discloses a method for biodegrading toxic chemicals that involves using microorganisms to remove organic pollutants such as chlorinated phenols. Column 8, line 21 to column 9, line 2 states that the microorganisms are pretreated in the presence of the specific organic pollutant in order to allow the microorganism to adapt to the toxicant and assimilate it as a preferred source of carbon. Portier notes that the microorganisms become genetically modified by such adaptation and become able to thrive in the presence of the pollutant. Column 10, lines 3-19 further states that cells are recovered and collected following pretreatment using centrifugation.

Weinstein, Numata and Portier are analogous art because they are from the same field of endeavor regarding biodegrading toxic chemicals.

At the time of the invention, it would have been obvious to pretreat the *B. midousuji* cells disclosed by Weinstein in the presence of the target pollutant (in this case dioxins) prior to crushing. Portier indicates that this would allow the cells to become genetically tailored for the specific degradation of a particular pollutant. Pre-culturing in the presence of a chlorinated aromatic compound prior to crushing would customize the cells for the enhanced removal of dioxins.

Furthermore, it would have been obvious to recover the crushed cells of Weinstein/Numata as a pellet following pre-culturing procedures. As evidenced by Portier, centrifugation is considered to be a notoriously well known means for recovering whole cells and crushed cells as a pellicle fraction.

With respect to claims 14-16, Weinstein, Numata and Portier disclose the system, method and preparation set forth in claims 1, 7 and 13. In addition, Weinstein and Numata each teach that microorganisms are cultured by mixing a contaminant with a medium comprising a nutrient source. As previously noted, Weinstein specifically discloses that dioxin compounds are degraded in the presence of *Bacillus midousuji* cells. Weinstein describes in column 4, lines 51-67 and throughout the reference in general that the cells are grown in the presence of nutrients under aerobic conditions and at an elevated temperature (above 62 degrees Celsius).

4) Claims 1-4, 7-10 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkata (US 6723242) in view of Weinstein (US 6420165), Numata (US 6521444) and Portier (US 4859594).

With respect to claims 1, 7, 13 and 17, Ohkata discloses a system and method for cleaning a contaminated matter comprising dioxins by decomposing the dioxins in the contaminated matter. The system comprises a reaction tank (Figure 2:22) for holding cells cultured in the presence of chlorinated aromatic compounds (dioxins) that have a substituent comprising an oxygen atom bonded to an aromatic ring and a chloro group bonded to an aromatic ring. The contaminated matter (Figure 2:K) is introduced to a pre-treatment tank (Figure 2:20) where it is mixed with water to form an aqueous medium (Figure 2:S1). This is described in column 14, line 61 to column 20, line 7. Ohkata, however, does not expressly indicate that the cells used to degrade the dioxins are *Bacillus midousuji*.

Weinstein discloses an apparatus and method for decomposing dioxin contaminants in an organic waste. Column 2, line 66 to column 3, line 25 and column 8, lines 23-67 state that *Bacillus midousuji* microorganisms are used to degrade dioxins.

Ohkata and Weinstein are analogous art because they are from the same field of endeavor regarding the biological degradation of dioxin contaminants.

At the time of the invention, it would have been obvious to ensure that the microorganisms utilized in the system of Ohkata were *Bacillus midousuji* cells. Ohkata discloses that *Bacillus midousuji* microorganisms are specifically adapted for destroying dioxin contaminant compounds. Since Ohkata states in column 17, line 66 to column 18, line 9 that microorganisms of the genera *Bacillus* are useful in the decontamination system, it would have been apparent use *Bacillus* species, such as *Bacillus midousuji*, that are particularly suited for the decomposition of dioxins.

The combination of Ohkata and Weinstein, however, still differs from Applicant's claimed invention because the references do not expressly indicate that the *Bacillus midousuji* cells are crushed.

Numata discloses a method for cleaning a contaminated matter by decomposing organic halogenated compounds. Numata teaches in column 3, line 63 to column 4, line 14 and in column 24, lines 26-44 that it is known in the art to crush microorganisms prior to the treatment of contaminated matter in order to prevent undesired effects on the environment.

At the time of the invention, it would have been obvious to crush the cultured *Bacillus midousuji* cells disclosed by Weinstein prior to their introduction into the contaminated matter.

As disclosed by Numata, this type of crushing is beneficial because it reduces the environmental impact associated with the delivery of microbes into a sample volume. Although Numata does state that crushing can be undesirable because it requires expensive equipment and a lot of time and labor, this concern must be considered with the previously stated advantages in mind. If one of ordinary skill in the art, according to an economic calculation, valued the ability to introduce inactive, crushed cells to a sample to remove contaminants over reduced costs and labor, then it would have been obvious to crush the microorganisms of Weinstein prior to decontamination procedures.

The combination of Ohkata, Weinstein and Numata, however, still differs from Applicant's claimed invention because Ohkata does not clearly indicate that the *B. midousuji* cells are cultured in the presence of a chlorinated aromatic compound prior to crushing and exposure to dioxins, or that the *B. midousuji* cells are centrifuged to separate the crushed cells into a pellicle fraction.

Portier discloses a method for biodegrading toxic chemicals that involves using microorganisms to remove organic pollutants such as chlorinated phenols. Column 8, line 21 to column 9, line 2 states that the microorganisms are pretreated in the presence of the specific organic pollutant in order to allow the microorganism to adapt to the toxicant and assimilate it as a preferred source of carbon. Portier notes that the microorganisms become genetically modified by such adaptation and become able to thrive in the presence of the pollutant. Column 10, lines 3-19 further states that cells are harvested following pretreatment via centrifugation

Ohkata, Weinstein, Numata and Portier are analogous art because they are from the same field of endeavor regarding biodegrading toxic chemicals.

At the time of the invention, it would have been obvious to pretreat the *B. midousuji* cells disclosed by Ohkata in the presence of the target pollutant (in this case dioxins) prior to crushing. Portier indicates that this would allow the cells to become genetically tailored for the specific degradation of a particular pollutant. Pre-culturing in the presence of a chlorinated aromatic compound prior to crushing would customize the cells for the enhanced removal of dioxins.

Furthermore, it would have been obvious to recover the crushed cells of Ohkata /Numata as a pellet following pre-culturing procedures. As evidenced by Portier, centrifugation is considered to be a notoriously well known means for recovering whole cells and crushed cells as a pellicle fraction. Centrifugation would have been beneficial because it is a low cost means capable of removing excess fluid and waste from the cell fraction prior to treatment.

With respect to claims 2 and 8, Ohkata, Weinstein, Numata and Portier disclose the apparatus and method set forth in claims 1 and 7 as set forth in the 35 U.S.C. 103 rejection above. In addition, Ohkata states that following dioxin degradation, fluids are moved form the reaction tank (Figure 2:22) to a solid-liquid separating tank (Figure 2:23). Processed liquid is removed via transfer line (Figure 2:53), and surplus sludge is removed via a drain (Figure 2:59). Column 27, lines 23-30 state that filtration means are used during solid-liquid separation.

With respect to claims 3, 4, 9 and 10, Ohkata, Weinstein, Numata and Portier disclose the apparatus and method set forth in claims 1, 2, 7 and 8 as set forth in the 35 U.S.C. 103 rejections

above. Additionally, Ohkata teaches that a pre-treatment tank (Figure 2:20) is provided for soaking contaminated matter (Figure 2:K) with water (Figure 2:L1). A fluid transport means (Figure 2:51) is also provided for transporting the fluid comprising the contaminated matter toward the reaction tank (Figure 2:22). Ohkata, however, does not expressly disclose the use of a seclusion means for secluding a source of the contaminated matter. Regardless, valves that act as secluding means are considered to be notoriously well known in the art. At the time of the invention, it would have been obvious to provide the inlet line transporting the fly ash slurry (Figure 2:K) to the pre-treatment tank with a valve capable of secluding the contaminated matter source from the reaction tanks.

With respect to claims 14-16, Ohkata, Weinstein, Numata and Portier disclose the system, method and preparation set forth in claims 1, 7 and 13. In addition, Weinstein and Numata each teach that microorganisms are cultured by mixing a contaminant with a medium comprising a nutrient source. As previously noted, Weinstein specifically discloses that dioxin compounds are degraded in the presence of *Bacillus midousuji* cells. Weinstein describes in column 4, lines 51-67 and throughout the reference in general that the cells are grown in the presence of nutrients under aerobic conditions and at an elevated temperature (above 62 degrees Celsius).

5) Claims 5, 6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkata (US 6723242) in view of Weinstein (US 6420165), Numata (US 6521444) and Portier

(US 4859594) as applied to claims 3, 4, 9 and 10, and further in view of Buchanan (US 5563066).

Ohkata, Weinstein, Numata and Portier disclose the apparatus and method set forth in claims 3, 4, 9 and 10 as set forth in the 35 U.S.C. 103 rejection above. Although Ohkata does indicate that water is added to the contaminated matter in the pre-treatment reactor, Ohkata however do not expressly state that water is added using a high pressure washing method.

Buchanan discloses a system for remediating contaminated soil containing organic compounds. Column 4, lines 4-30 and column 11, line 49 to column 12, line 2 states that the contaminated matter is washed by jetting water under high pressure through the holding container using a spray system (Figure 4:40).

Ohkata, Weinstein, Numata, Portier and Buchanan are analogous art because they are from the same field of endeavor regarding biochemical systems for cleaning a contaminated matter.

At the time of the invention, it would have been obvious to ensure that the water delivery system disclosed by Ohkata was capable of washing the contaminated matter using a jet of fluids under high pressure. Buchanan states in column 11, line 49 to column 12, line 2 that high pressure spraying is characterized by a shearing action that causes the entirety of the contaminated matter to become a saturated slurry. The use of high pressure spraying helps to ensure that water delivery to all areas of the contaminated matter is uniform and effective. Buchanan states that the creation of an aqueous slurry serves to enable the degradation of contaminants.

Response to Arguments

Applicant's arguments filed 17 October 2008 with respect to the 35 U.S.C. 102 rejections involving Ohkata have been fully considered and are persuasive. Therefore, these rejections have been withdrawn. However, upon further consideration, a new ground of rejection is made in view of the combination of Ohkata with Portier.

The Portier reference addresses the deficiencies of Ohkata by indicating that it is known in the art to use a centrifuge to purify cells prior to introduction into a reactor tank.

Applicant's arguments filed 17 October 2008 with respect to the 35 U.S.C. 103 rejections involving the combination of Ohkata, Weinstein, Numata and Portier and the combination of Weinstein, Numata and Portier have been fully considered, but are not persuasive.

As described above, the Portier reference teaches that it is known in the art to recover cells from a treatment solution prior to use in the degradation of contaminants through centrifugation. This is described in column 10, lines 3-19. This is likewise described by Numata in column 9, lines 12-15 and in column 12, lines 21-27.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A. Bowers whose telephone number is (571) 272-8613. The examiner can normally be reached on Monday-Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William H. Beisner/
Primary Examiner, Art Unit 1797

/Nathan A Bowers/
Examiner, Art Unit 1797